Federal Democratic Republic of Ethiopia

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ET 1188 (2005) (English): Leather Determination of chromium as chromic oxide

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ETHIOPIAN STANDARD

ES 1188:2005

Second edition
2005-03-12

Leather — Determination of chromium as chromic oxide

ICS: 67.080.01

Descriptors: determination of chromium as chromic oxide, method A (wet oxidation method), method, ‘b’ and method’ c’
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Price based on 3 pages.

Reference number
ES 1188:2005

Foreword

This Ethiopian standard has been prepared under the direction of Textile and Leather Technology Standards Committee.

In the preparation of this standard reference was made to the following document.

Tanzania standard, TZS 198: 1984, Leather- Determination of chromium as chromic oxide

This second edition ES 1188 cancels and replaces the first edition, leather – Determination of chromium as chromic oxide (ES DN.8: 1990), which has been technically revised.

Acknowledgement is made for the use of the information from the above publication.

Leather – Determination of chromium as chromic oxide ($Cr_2 O_3$)

1 Scope

This Ethiopian standard specifies the three alternative methods for the determination of chromium as chromic oxide ($Cr_2 O_3$). It is applicable to all types of leather containing chromium salts.

2 Normative references

The following standards contain provisions, which, through reference in this text, constitute provisions of the Ethiopian standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on the Ethiopian standards are encouraged to investigate the possibility of applying the most recent editions of the Ethiopian standard indicated below. Registers of currently valid standards are maintained in the Quality and Standards Authority of Ethiopia.

ES 1180:2005, Leather - Terminology
ES ISO 2417 Leather – Physical and mechanical tests- Determination of static absorption of water
ES ISO 2418: 2005, Leather – Chemical, physical and mechanical fastness test - Sampling
ES ISO 2419:2005, Leather – Physical and mechanical test – Sample preparation and conditioning.
ES ISO 3380: 2005, Leather Determination of shrinkage temperature at the wet-blue stage
ES ISO 2418: 2005, Leather - Determination of Laboratory samples – Location and identification.
ES ISO 2419: 2005, Leather -Preparation and conditioning of test samples
ES ISO 2588: 2005, Leather- Sampling – Number of items for a gross sample

3 Definition

For the purpose of this working draft the definitions in ES 1180 shall apply.

4 Sampling

Sampling of leather shall be carried out in accordance with the methods of test specified in ES ISO 2418, ES ISO 2419, ES ISO 2588 and ES ISO 4044*.

5 Reagents

During the analysis reagents of a recognized analytical reagent quality and distilled water or water of equal puirity shall be used

5. 1 Concentrated Sulphuric acid - relative density of 1.84,

5.2 Perchloric acid 60 to 70 percent (m/m),

5 3 Sodium thiosulphate solution - approximately 0.O5 mol/l standard volumetric solution,

5.4 Phosphoric acid 85%(m/m)

5.5 Potassium iodide (KI) crystal

5.6 Hydrochloric acid, concentrated (density 1.18g/cm^3)

5.7 Starch indicators, 10 g/l 0r soluble starch powder.

6 Apparatus

The following apparatus shall be used:

6.1 Kjeldhal or Erlenmeyer flask - 300 ml capacity with ground glass stopper,

6.2 Conical flask - with ground glass stopper,

6.3 Quartz crucible - iron or nickel 30-38 ml.

6.4 Muffle furnace capable of being maintained at a temperature close to but not exceeding 800°C

6.5 Burette with approximate scale

6.6 300 ml ground stoppered iodine flask

7 Procedure

The leather shall be sampled and prepared for chemical testing according to clause 4 here in.
Weigh accurately about a quantity of chromium leather containing approximately 17 mg Cr from the test portion and transfer it to a heat resistant 300ml Erlenmeyer or kjeldhal flask or quartz crucible. Heat in muffle furnace at 700°C-750 °C for thirty mintues, or carefully carbonize it over a low flame. Moisten the residue with a few drops of sulpuric acid.

Heats on a low flame (or on a boiling ring) until sulphur trioxide fumes are no longer visible. Repeat the addition of acid and heating At last in a muffle furnace at 700 °C - 750°C for 30 mintues. Cool the crucible and add 2ml perchloric acid. Cover the crucible with two watch glasses. Heat the crucible for one hour on the boiling point, but evaporation should be avoided.

After a minimum of 50 minutes of cooling add about 10 ml water and rinse with water into a 300 ml ground stoppered iodine flask. Dilute the solution to 100ml. Add 5ml concerted hydrochloric acid, 5ml concentrated phosphoric acid and 400 mg potassium iodine and stopper and allow standing for 10 minutes in the dark. Rinse the stopper and the neck of the flask with deionised water. Titrate with standardized sodium thiosulphate solution, adding starch indicator (2 ml) just before the end of the titration.

8 Expressions of results

The chromic oxide (Cr_2 O3), as "C" in the leather % by mass, shall be calculated as follows:

$$C = \frac{C \times V \times 152 \times 100}{6 \times m}$$

Where;

C is the concentration of standardized sodium thiosulphate in mol/l

V is volume (ml) of standardized sodium thiosulphate solution.

m is the mass in mg of the original sample of leather taken.

9 Repeatability

The results of duplicate determination should not differ by more than 0.1 % calculated on the original mass of leather.

10 Test report

The test report shall include the following particulars;

a) The result obtained, to 1 decimal place;
b) A reference to this standard;
c) Identification details of the sample;
d) Details of any special circumstances, which may have affed the result.

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Quality and Standards Authority of Ethiopia

ORGANIZATION AND SERVICES OFFERED

The Quality and Standards Authority of Ethiopia (QSAE) is the national standards body of Ethiopia established in 1970.

It has undergone several restructuring programs since its establishment, and currently provides a comprehensive range of services in the following areas:

- Ethiopian Standards development;
- Regulation enforcement (Compulsory product certification and legal metrology);
- Laboratory testing in the fields of mechanical, electrical, chemical and biological testing;
- Calibration of instruments in various measurement areas;
- Product inspection;
- Training on standardization, quality, testing and metrology; and
- Provision of up-to-date standards information.

QSAE operates a national product certification scheme whereby manufacturers licensed under the scheme have the right to use the Quality Mark shown in the figure below.

ETHIOPIAN STANDARDS

Technical committees made up of experts from industry, trade, government, and other user groups prepare Ethiopian Standards. The requirements or recommendations contained in Ethiopian Standards are a consensus of the views of representative interests and also take account of comments received from the general public and other sources. Ethiopian Standards are kept under continuous review after publication and are updated regularly to take account of latest scientific and technological changes.

Orders for all Ethiopian Standards, and international and foreign national standards, including electronic versions, should be addressed to the Documentation and Technical Information Group at the Head Office. A Catalogue of Ethiopian Standards is also available at our Head Office, Branches and Representative Offices.

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QSAE, representing Ethiopia, is a member of the International Organization for Standardization (ISO), International Organization of Legal Metrology (OIML) and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the International Electro-technical Commission (IEC). It is a founding member of the African Regional Organization for Standardization (ARSO).

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The Head Office of QSAE is at Addis Ababa with seven Branches and three Representative Offices elsewhere in the country and at Djibouti ready to cater for all your quality and standards needs.

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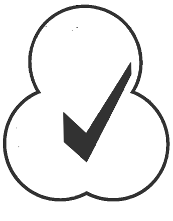

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